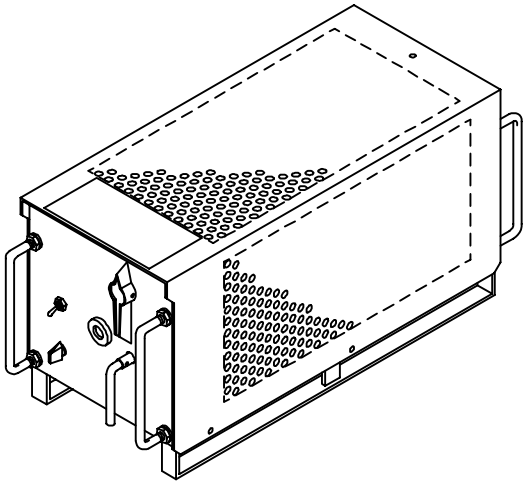
Miller®

OM-805 079 869D

May 1994

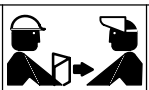
OWNER'S MANUAL



MOG-200C And MOG-200PRC

- Multiple Operator Resistance Grids (MOG)
- For SMAW And GTAW Operating From CV/DC Welding Power Source
- Output Of Grid: 195 Amperes, 100% Duty Cycle
- Overload Protection
- Grids Available With Case (C Models) Or With Polarity Reversing (PRC Models)
- Grid Option: 2-1/2 Ampere Switch
- For Options And Accessories See Rear Cover

- Read and follow these instructions and all safety blocks carefully.
- Have only trained and qualified persons install, operate, or service this unit.
- Call your distributor if you do not understand the directions.



- Give this manual to the operator.

- For help, call your distributor
- or: MILLER Electric Mfg. Co., P.O. Box 1079, Appleton, WI 54912 414-734-9821

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From Miller to You

Thank you and *congratulations* on choosing Miller. Now you can get the job done and get it done right. We know you don't have time to do it any other way.

That's why when Niels Miller first started building arc welders in 1929, he made sure his products offered long-lasting value and superior quality. Like you, his customers couldn't afford anything less. Miller products had to be more than the best they could be. They had to be the best you could buy.

Today, the people that build and sell Miller products continue the tradition. They're just as committed to providing equipment and service that meets the high standards of quality and value established in 1929.

This Owner's Manual is designed to help you get the most out of your Miller products. Please take time to read the Safety precautions. They will help you protect yourself against potential hazards on the worksite. We've made installation and operation quick and easy. With Miller you can count on years of reliable service with proper maintenance. And if for some reason the unit needs repair, there's a Troubleshooting section that will help you figure out what the problem is. The parts list will then help you to decide which exact part you may need to fix the problem. Warranty and service information for your particular model are also provided.

ISO 9001 REGISTERED QUALITY SYSTEM

Miller is the first welding equipment manufacturer in the U.S.A. to be registered to the ISO 9001 Quality System Standard.

Miller Electric manufactures a full line of welders and welding related equipment. For information on other quality Miller products, contact your local Miller distributor to receive the latest full line catalog or individual catalog sheets. **To locate your nearest distributor or service agency call 1-800-4-A-Miller, or visit us at www.MillerWelds.com on the web.**

TRUE BLUE® WARRANTY

Working as hard as you do – every power source from Miller is backed by the most hassle-free warranty in the business.

Miller offers a Technical Manual which provides more detailed service and parts information for your unit. To obtain a Technical Manual, contact your local distributor. Your distributor can also supply you with Welding Process Manuals such as SMAW, GTAW, GMAW, and GMAW-P.

Miller® *The Power of Blue.*

ARC WELDING SAFETY PRECAUTIONS

⚠ WARNING

ARC WELDING can be hazardous.

PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS KEEP AWAY UNTIL CONSULTING YOUR DOCTOR.

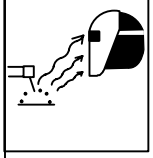
In welding, as in most jobs, exposure to certain hazards occurs. Welding is safe when precautions are taken. The safety information given below is only a summary of the more complete safety information that will be found in the Safety Standards listed on the next page. Read and follow all Safety Standards.

HAVE ALL INSTALLATION, OPERATION, MAINTENANCE, AND REPAIR WORK PERFORMED ONLY BY QUALIFIED PEOPLE.

ELECTRIC SHOCK can kill.

Touching live electrical parts can cause fatal shocks or severe burns. The electrode and work circuit is electrically live whenever the output is on. The input power circuit and machine internal circuits are also live when power is on. In semiautomatic or automatic wire welding, the wire, wire reel, drive roll housing, and all metal parts touching the welding wire are electrically live. Incorrectly installed or improperly grounded equipment is a hazard.

1. Do not touch live electrical parts.
2. Wear dry, hole-free insulating gloves and body protection.
3. Insulate yourself from work and ground using dry insulating mats or covers big enough to prevent any physical contact with the work or ground.
4. Disconnect input power or stop engine before installing or servicing this equipment. Lockout/tagout input power according to OSHA 29 CFR 1910.147 (see Safety Standards).
5. Properly install and ground this equipment according to its Owner's Manual and national, state, and local codes.
6. Always verify the supply ground – check and be sure that input power cord ground wire is properly connected to ground terminal in disconnect box or that cord plug is connected to a properly grounded receptacle outlet.
7. When making input connections, attach proper grounding conductor first – double-check connections.
8. Frequently inspect input power cord for damage or bare wiring – replace cord immediately if damaged – bare wiring can kill.
9. Turn off all equipment when not in use.
10. Do not use worn, damaged, undersized, or poorly spliced cables.
11. Do not drape cables over your body.
12. If earth grounding of the workpiece is required, ground it directly with a separate cable – do not use work clamp or work cable.
13. Do not touch electrode if you are in contact with the work, ground, or another electrode from a different machine.
14. Use only well-maintained equipment. Repair or replace damaged parts at once. Maintain unit according to manual.
15. Wear a safety harness if working above floor level.
16. Keep all panels and covers securely in place.
17. Clamp work cable with good metal-to-metal contact to workpiece or worktable as near the weld as practical.



ARC RAYS can burn eyes and skin; NOISE can damage hearing; FLYING SLAG OR SPARKS can injure eyes.

Arc rays from the welding process produce intense visible and invisible (ultraviolet and infrared) rays that can burn eyes and skin. Noise from some processes can damage hearing. Chipping, grinding, and welds cooling throw off pieces of metal or slag.

NOISE

1. Use approved ear plugs or ear muffs if noise level is high.

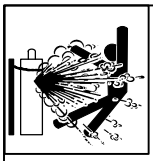
ARC RAYS

2. Wear a welding helmet fitted with a proper shade of filter to protect your face and eyes when welding or watching (see ANSI Z49.1 and Z87.1 listed in Safety Standards).
3. Wear approved safety glasses with side shields.
4. Use protective screens or barriers to protect others from flash and glare; warn others not to watch the arc.
5. Wear protective clothing made from durable, flame-resistant material (wool and leather) and foot protection.

FUMES AND GASES can be hazardous to your health.

Welding produces fumes and gases. Breathing these fumes and gases can be hazardous to your health.

1. Keep your head out of the fumes. Do not breathe the fumes.
2. If inside, ventilate the area and/or use exhaust at the arc to remove welding fumes and gases.
3. If ventilation is poor, use an approved air-supplied respirator.
4. Read the Material Safety Data Sheets (MSDSs) and the manufacturer's instruction for metals, consumables, coatings, cleaners, and degreasers.
5. Work in a confined space only if it is well ventilated, or while wearing an air-supplied respirator. Always have a trained watchperson nearby. Welding fumes and gases can displace air and lower the oxygen level causing injury or death. Be sure the breathing air is safe.
6. Do not weld in locations near degreasing, cleaning, or spraying operations. The heat and rays of the arc can react with vapors to form highly toxic and irritating gases.
7. Do not weld on coated metals, such as galvanized, lead, or cadmium plated steel, unless the coating is removed from the weld area, the area is well ventilated, and if necessary, while wearing an air-supplied respirator. The coatings and any metals containing these elements can give off toxic fumes if welded.



CYLINDERS can explode if damaged.

Shielding gas cylinders contain gas under high pressure. If damaged, a cylinder can explode. Since gas cylinders are normally part of the welding process, be sure to treat them carefully.

1. Protect compressed gas cylinders from excessive heat, mechanical shocks, slag, open flames, sparks, and arcs.
2. Install cylinders in an upright position by securing to a stationary support or cylinder rack to prevent falling or tipping.
3. Keep cylinders away from any welding or other electrical circuits.
4. Never drape a welding torch over a gas cylinder.
5. Never allow a welding electrode to touch any cylinder.
6. Never weld on a pressurized cylinder – explosion will result.
7. Use only correct shielding gas cylinders, regulators, hoses, and fittings designed for the specific application; maintain them and associated parts in good condition.
8. Turn face away from valve outlet when opening cylinder valve.
9. Keep protective cap in place over valve except when cylinder is in use or connected for use.
10. Read and follow instructions on compressed gas cylinders, associated equipment, and CGA publication P-1 listed in Safety Standards.

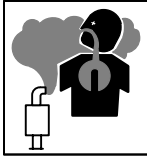
WELDING can cause fire or explosion.

Welding on closed containers, such as tanks, drums, or pipes, can cause them to blow up. Sparks can fly off from the welding arc. The flying sparks, hot workpiece, and hot equipment can cause fires and burns. Accidental contact of electrode to metal objects can cause sparks, explosion, overheating, or fire. Check and be sure the area is safe before doing any welding.

1. Protect yourself and others from flying sparks and hot metal.
2. Do not weld where flying sparks can strike flammable material.
3. Remove all flammables within 35 ft (10.7 m) of the welding arc. If this is not possible, tightly cover them with approved covers.
4. Be alert that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas.
5. Watch for fire, and keep a fire extinguisher nearby.
6. Be aware that welding on a ceiling, floor, bulkhead, or partition can cause fire on the hidden side.
7. Do not weld on closed containers such as tanks, drums, or pipes, unless they are properly prepared according to AWS F4.1 (see Safety Standards).
8. Connect work cable to the work as close to the welding area as practical to prevent welding current from traveling long, possibly unknown paths and causing electric shock and fire hazards.
9. Do not use welder to thaw frozen pipes.
10. Remove stick electrode from holder or cut off welding wire at contact tip when not in use.
11. Wear oil-free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes, and a cap.
12. Remove any combustibles, such as a butane lighter or matches, from your person before doing any welding.

⚠ WARNING

ENGINES can be hazardous.



ENGINE EXHAUST GASES can kill.

Engines produce harmful exhaust gases.

1. Use equipment outside in open, well-ventilated areas.
2. If used in a closed area, vent engine exhaust outside and away from any building air intakes.

ENGINE FUEL can cause fire or explosion.

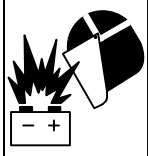
Engine fuel is highly flammable.

1. Stop engine and let it cool off before checking or adding fuel.
2. Do not add fuel while smoking or if unit is near any sparks or open flames.
3. Do not overfill tank – allow room for fuel to expand.
4. Do not spill fuel. If fuel is spilled, clean up before starting engine.

MOVING PARTS can cause injury.

Moving parts, such as fans, rotors, and belts can cut fingers and hands and catch loose clothing.

1. Keep all doors, panels, covers, and guards closed and securely in place.
2. Stop engine before installing or connecting unit.
3. Have only qualified people remove guards or covers for maintenance and troubleshooting as necessary.
4. To prevent accidental starting during servicing, disconnect negative (–) battery cable from battery.
5. Keep hands, hair, loose clothing, and tools away from moving parts.
6. Reinstall panels or guards and close doors when servicing is finished and before starting engine.



SPARKS can cause BATTERY GASES TO EXPLODE; BATTERY ACID can burn eyes and skin.

Batteries contain acid and generate explosive gases.

1. Always wear a face shield when working on a battery.
2. Stop engine before disconnecting or connecting battery cables.
3. Do not allow tools to cause sparks when working on a battery.
4. Do not use welder to charge batteries or jump start vehicles.
5. Observe correct polarity (+ and –) on batteries.

STEAM AND PRESSURIZED HOT COOLANT can burn face, eyes, and skin.

It is best to check coolant level when engine is cold to avoid scalding.

1. If the engine is warm and checking is needed, follow steps 2 and 3.
2. Wear safety glasses and gloves and put a rag over cap.
3. Turn cap slightly and let pressure escape slowly before completely removing cap.

PRINCIPAL SAFETY STANDARDS

Safety in Welding and Cutting, ANSI Standard Z49.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami FL 33126

Safety and Health Standards, OSHA 29 CFR 1910, from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Recommended Safe Practices for the Preparation for Welding and Cutting of Containers That Have Held Hazardous Substances, American Welding Society Standard AWS F4.1, from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126

National Electrical Code, NFPA Standard 70, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

Safe Handling of Compressed Gases in Cylinders, CGA Pamphlet P-1, from Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202.

Code for Safety in Welding and Cutting, CSA Standard W117.2, from Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3.

Safe Practices For Occupation And Educational Eye And Face Protection, ANSI Standard Z87.1, from American National Standards Institute, 1430 Broadway, New York, NY 10018.

Cutting And Welding Processes, NFPA Standard 51B, from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

EMF INFORMATION

NOTE ☞ *Considerations About Welding And The Effects Of Low Frequency Electric And Magnetic Fields*

The following is a quotation from the General Conclusions Section of the U.S. Congress, Office of Technology Assessment, *Biological Effects of Power Frequency Electric & Magnetic Fields – Background Paper*, OTA-BP-E-53 (Washington, DC: U.S. Government Printing Office, May 1989): ". . . there is now a very large volume of scientific findings based on experiments at the cellular level and from studies with animals and people which clearly establish that low frequency magnetic fields can interact with, and produce changes in, biological systems. While most of this work is of very high quality, the results are complex. Current scientific understanding does not yet allow us to interpret the evidence in a single coherent framework. Even more frustrating, it does not yet allow us to draw definite conclusions about questions of possible risk or to offer clear science-based advice on strategies to minimize or avoid potential risks."

To reduce magnetic fields in the workplace, use the following procedures:

1. Keep cables close together by twisting or taping them.
2. Arrange cables to one side and away from the operator.
3. Do not coil or drape cables around the body.
4. Keep welding power source and cables as far away as practical.
5. Connect work clamp to workpiece as close to the weld as possible.

About Pacemakers:

The above procedures are among those also normally recommended for pacemaker wearers. Consult your doctor for complete information.

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SECTION 1 – SAFETY INFORMATION

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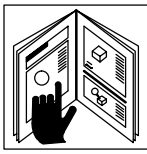
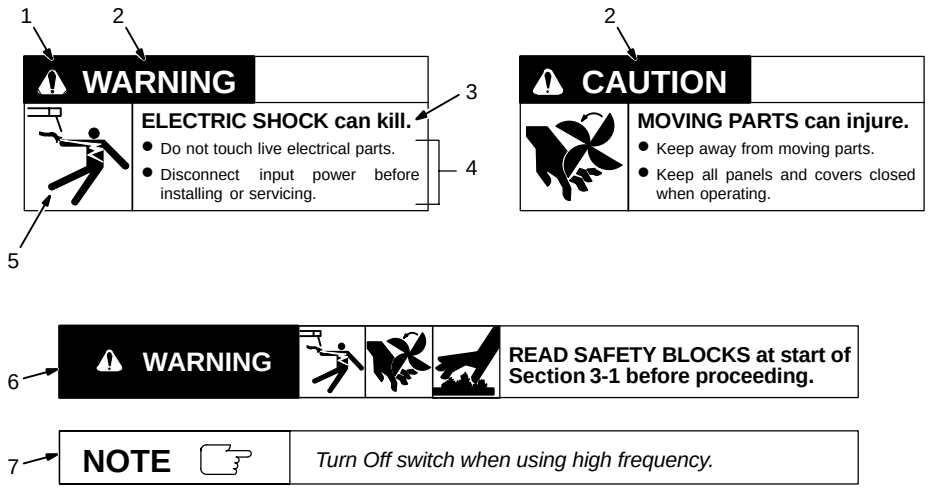


- Read all safety messages throughout this manual.
- Obey all safety messages to avoid injury.
- Learn the meaning of WARNING and CAUTION.



1 Safety Alert Symbol

2 Signal Word

WARNING means possible death or serious injury can happen.

CAUTION means possible minor injury or equipment damage can happen.

3 Statement Of Hazard And Result

4 Safety Instructions To Avoid Hazard

5 Hazard Symbol (If Available)

6 Safety Banner

Read safety blocks for each symbol shown.

7 NOTE

Special instructions for best operation – not related to safety.

Figure 1-1. Safety Information

SECTION 2 – SPECIFICATIONS

Table 2-1. Resistance Grid

Specification	Description
Weld Amperage Adjustment	Coarse: 50 Ampere Steps; Fine: 5 Ampere Steps; Optional: 2-1/2 Ampere*
Overall Dimensions	Height: 12 in (305 mm); Width: 10 in (254 mm); Length: 28 in (711 mm)
Rated Welding Amperes Output	195 Amperes At 25 VDC, 100% Duty Cycle
Weight	Net: 35 lb (16 kg); Ship: 39 lb (18 kg)

*Units with Polarity switch include a 2-1/2 Ampere switch.

SECTION 3 – INSTALLATION

3-1. Typical Multiple Operator System Component Relationships

WARNING

ELECTRIC SHOCK can kill; TWO TIMES NORMAL OPEN-CIRCUIT VOLTS exists between electrode holders of opposite polarity.

- Do not touch live electrical parts.
- Do not touch electrode holders of opposite polarity at the same time.
- Separate electrode holders of opposite polarity to prevent contact.
- Consult ANSI Z49.1 for common grounding safe practices.

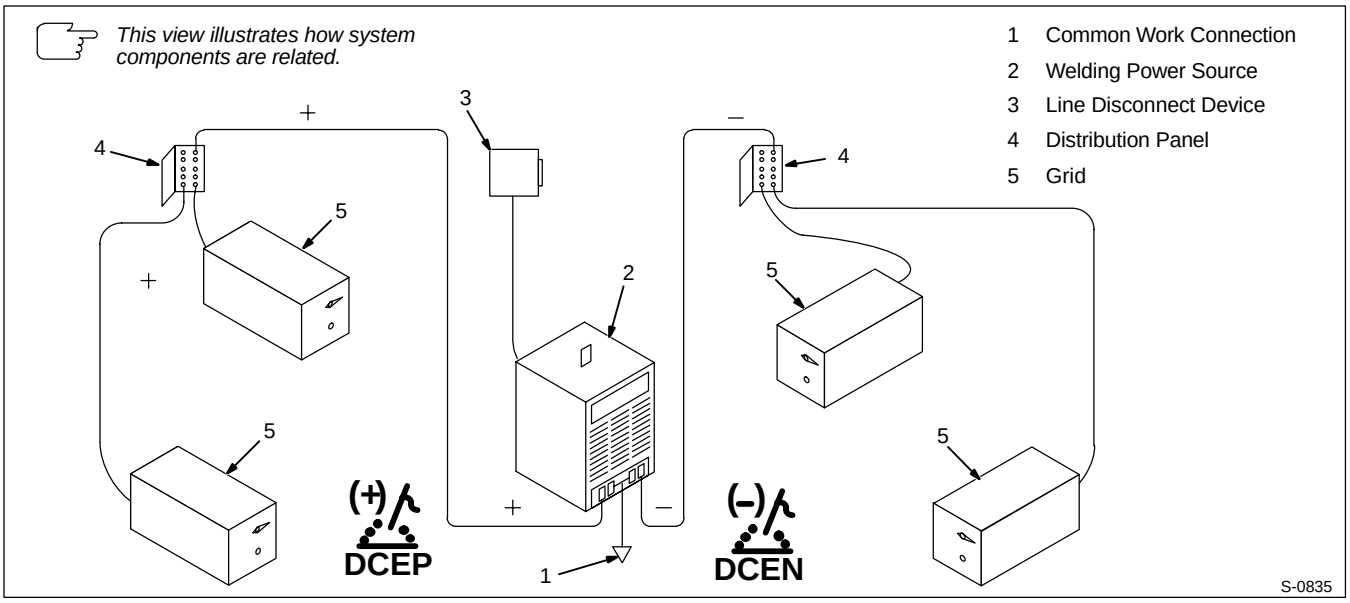


Figure 3-1. Typical Component Relationships

3-2. Selecting A Location And Moving Resistance Grid Or Multi-Grid Rack

⚠ WARNING

ELECTRIC SHOCK can kill.
- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power BEFORE moving grid.

FIRE OR EXPLOSION can result from placing unit on, over, or near combustible surfaces.
- Do not locate unit on, over, or near combustible surfaces.
- Do not install unit near flammables.

BLOCKED AIRFLOW causes overheating and possible damage to unit.
- Do not block or filter airflow.

Warranty is void if any type of filter is used.

FUMES can be hazardous; LACK OF FRESH AIR AND PROPER VENTILATION can be harmful.
- Do not breathe welding fumes.
- Place unit only where there is a good fresh air supply and proper ventilation.

FALLING EQUIPMENT can cause serious personal injury and equipment damage.
- On racks, use lifting eyes to lift and move unit.
- Use equipment of adequate capacity to lift the unit.
- Use proper lifting procedures for racks to prevent tipping and falling.
- Have two persons of adequate physical strength lift individual grids at handles.

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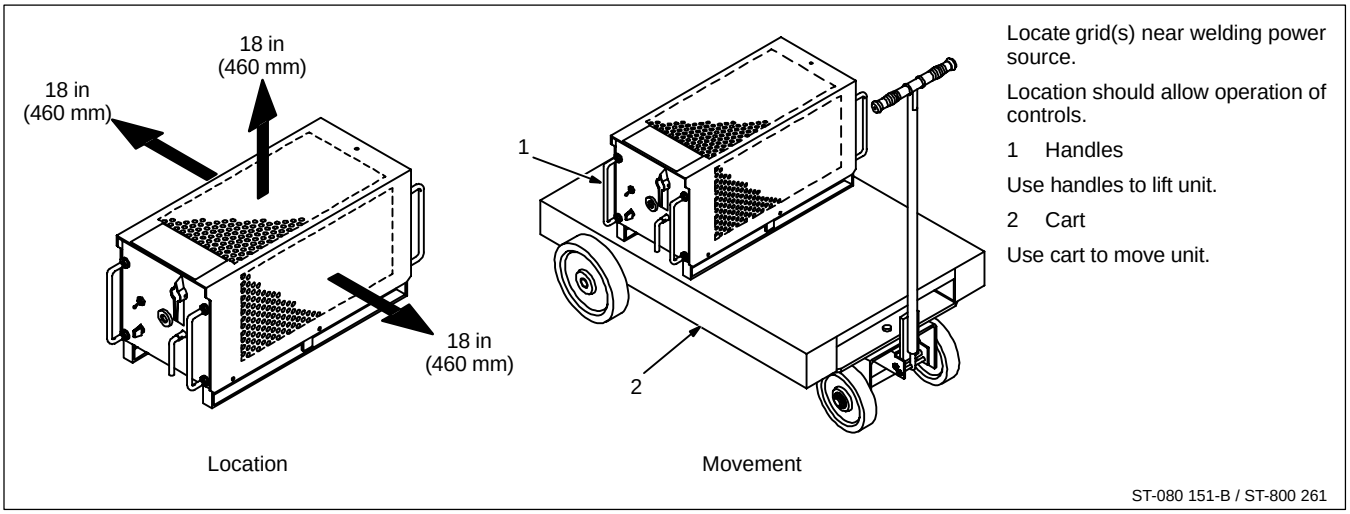

Figure 3-2. Location and Movement Of Resistance Grid

3-3. Preparing And Connecting Weld Input/Output Cables

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before making any weld output connections.

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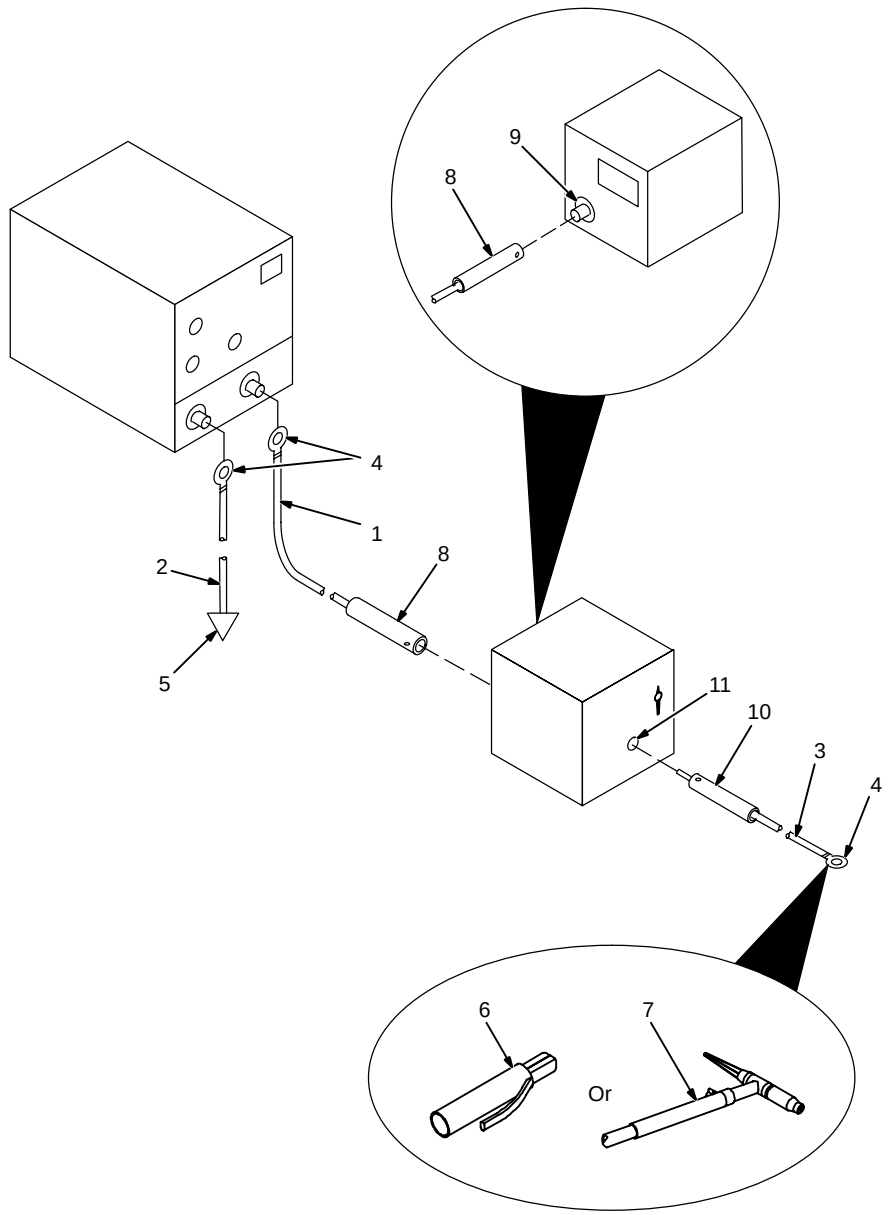
A. Weld Input/Output Cables



1 Weld Input Cable

2 Work Cable

3 Weld Output Cable

If necessary, use Table 3-1 to select proper cable size.

Use shortest cables possible.

Do not use damaged cables.

4 Terminal Lug

Use lugs of proper amperage capacity and hole size for connecting to common work, electrode holder(s), and weld output terminals (if applicable).

5 Common Work Connection

Connect work cable to common work according to codes.

6 Insulated Electrode Holder

7 GTAW Torch

Install according to manufacturer's instructions.

8 Female Camlok Connector

Install onto weld input cable as shown in Figure 3-4.

9 Weld Input Receptacle

Connect cable to weld input receptacle on rear panel of grid.

10 Male Camlok Connector

Install onto weld output cable as shown in Figure 3-5.

11 Electrode Receptacle

Connect weld output cable to Electrode receptacle.

Tools Needed:

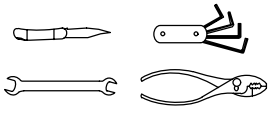


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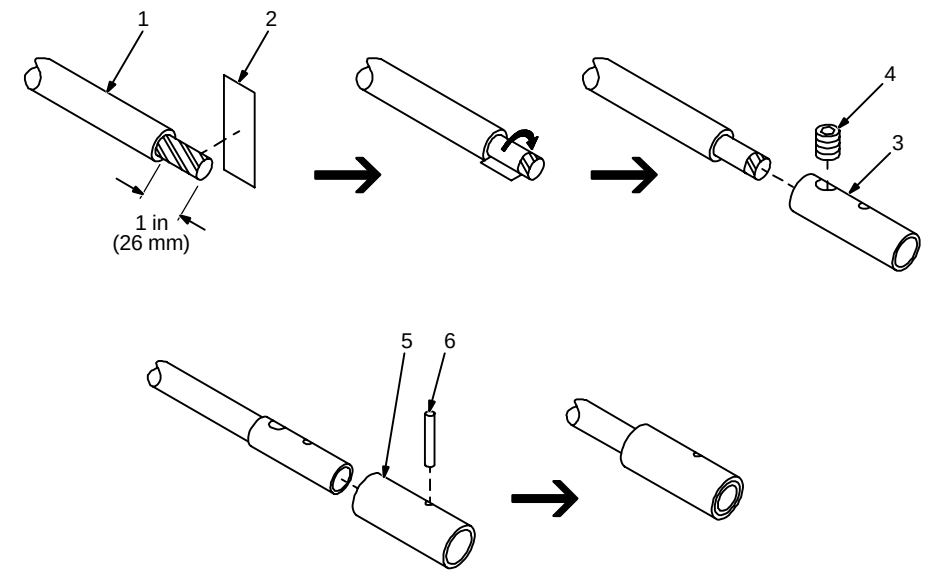
Figure 3-3. Weld Input/Output Cables For Resistance Grid

B. Camlok Connectors



1 Weld Input Cable

Strip insulation as shown.

2 Copper Strip (Two Included)

3 Connector Body

Wrap strip around bare weld cable (use two on small diameter cable), and insert into connector body.

4 Setscrew

Tighten setscrew against copper strip.

5 Handle

6 Pin

Slide handle over connector body so holes align; secure by tapping pin into place.

Tools Needed:

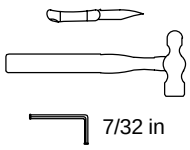


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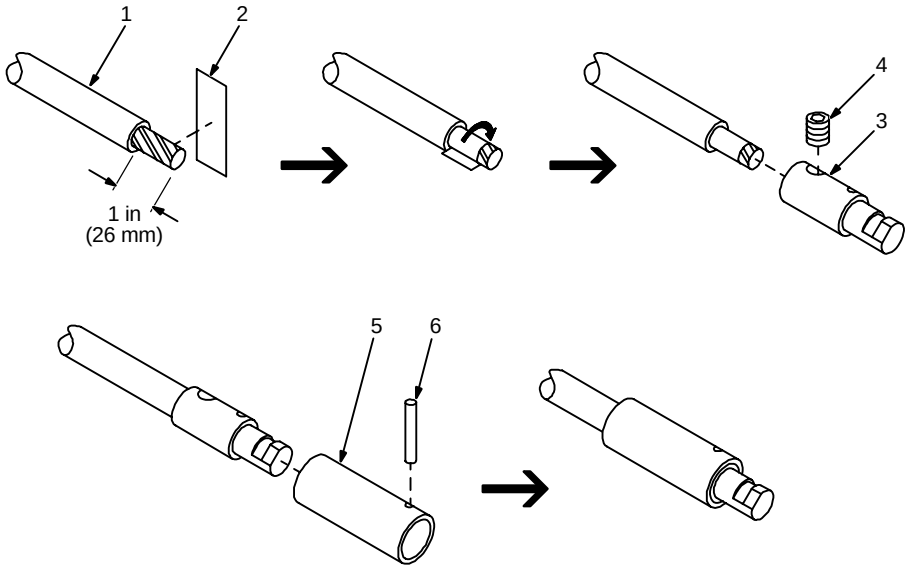
Figure 3-4. Female Camlok Connector Assembly



1 Weld Output Cable

Strip insulation as shown.

2 Copper Strip (Two Included)

3 Connector Body

Wrap strip around bare weld cable (use two on small diameter cable), and insert into connector body.

4 Setscrew

Tighten setscrew against copper strip.

5 Handle

6 Pin

Slide handle over connector body so holes align; secure by tapping pin into place.

Tools Needed:

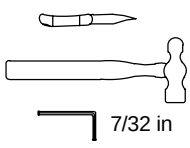


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Figure 3-5. Male Camlok Connector Assembly

Table 3-1. Weld Cable Size*

Welding Amperes	Total Cable (Copper) Length In Weld Circuit Not Exceeding							
	100 ft (30 m) Or Less		150 ft (45 m)	200 ft (60 m)	250 ft (70 m)	300 ft (90 m)	350 ft (105 m)	400 ft (120 m)
	10 To 60% Duty Cycle	60 Thru 100% Duty Cycle	10 Thru 100% Duty Cycle					
100	4	4	4	3	2	1	1/0	1/0
150	3	3	2	1	1/0	2/0	3/0	3/0
200	3	2	1	1/0	2/0	3/0	4/0	4/0
250	2	1	1/0	2/0	3/0	4/0	2-2/0	2-2/0
300	1	1/0	2/0	3/0	4/0	2-2/0	2-3/0	2-3/0

*Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of at least 300 circular mils per ampere. S-0007-D

SECTION 4 – OPERATION

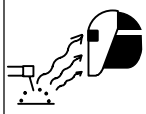
⚠ WARNING

ELECTRIC SHOCK can kill; TWO TIMES NORMAL OPEN-CIRCUIT VOLTS exists between electrode holders of opposite polarity.

- Always wear dry insulating gloves.
- Insulate yourself from work and ground.
- Do not touch live electrical parts.
- Keep all panels and covers securely in place.
- Do not touch electrode holders of opposite polarity at the same time.
- Separate electrode holders of opposite polarity to prevent contact.
- See ANSI Z49.1 and OSHA TITLE 29, CHAPTER XVII, PART 1910, Subpart Q.

WELDING can cause fire or explosion.

- Do not weld near flammable material.
- Watch for fire; keep extinguisher nearby.
- Do not locate unit over combustible surfaces.
- Do not weld on closed containers.
- Allow work and equipment to cool before handling.



ARC RAYS can burn eyes and skin; NOISE can damage hearing.

- Wear welding helmet with correct shade of filter.
- Wear correct eye, ear, and body protection.

FUMES AND GASES can be hazardous to your health.

- Keep your head out of the fumes.
- Ventilate area, or use breathing device.
- Read Material Safety Data Sheets (MSDSs) and manufacturer's instructions for material used.

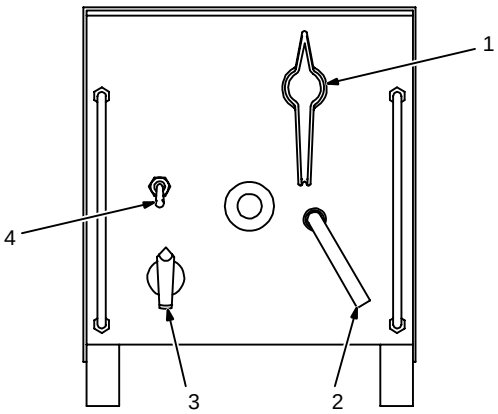
HOT SURFACES AND EQUIPMENT can cause burns.

- Allow equipment to cool before inspecting or servicing.
- Wear correct hand and body protection.
- Do not place anything on or near this unit during operation.

MAGNETIC FIELDS FROM HIGH CURRENTS can affect pacemaker operation.

- Pacemaker wearers keep away.
- Wearers should consult their doctor before going near arc welding, gouging, or spot welding operations.

See Safety Precautions at beginning of manual for basic welding safety information. swarn6.1* 10/91



1 Coarse Amperage Control

2 Polarity Switch

This switch is included on PRC units.

3 Fine Amperage Control

4 2-1/2 Ampere Switch

This switch is included on units with Polarity switch. Switch is optional for all other models.

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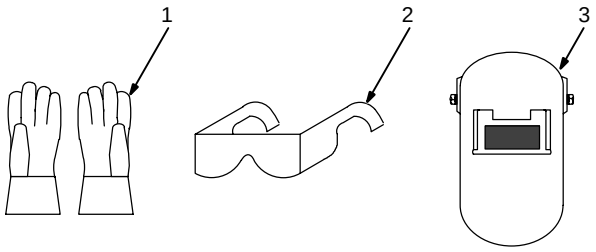
Figure 4-1. Controls (PRC Model Shown)



Wear the following while welding:

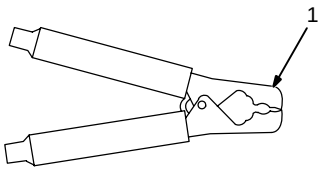
1 Dry, Insulating Gloves

2 Safety Glasses With Side Shields

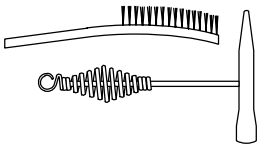
3 Welding Helmet With Correct Shade Of Filter (See ANSI Z49.1)

sb3.1 1/94

Figure 4-2. Safety Equipment



Tools Needed:



1 Work Clamp

Connect work clamp to a clean, paint-free location on workpiece, as close to weld area as possible.

Use wire brush or sandpaper to clean metal at weld joint area. Use chipping hammer to remove slag after welding.

sb4.1 2/93

Figure 4-3. Work Clamp

⚠ WARNING

ELECTRIC SHOCK can kill; TWO TIMES NORMAL OPEN-CIRCUIT VOLTS exists between electrode holders of opposite polarity.

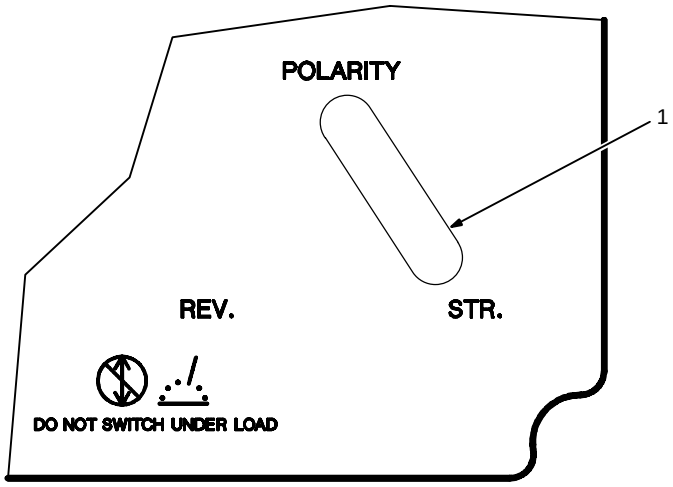
- Do not touch live electrical parts.
- Do not touch electrode holders of opposite polarity at the same time.
- Separate electrode holders of opposite polarity to prevent contact.
- See ANSI Z49.1 and OSHA TITLE 29, CHAPTER XVII, PART 1910, Subpart Q.

ARCING can damage switch.

- Do not change Polarity switch position while welding or under load.

Arcing inside switch can damage contacts, causing switch to fail.

warn5.1* 293



1 Polarity Switch

Use switch to select polarity of weld output.

For Direct Current Electrode Negative (DCEN), use Straight (STR) position.

For Direct Current Electrode Positive (DCEP), use Reverse (REV) position.

Ref. ST-047 549-E

Figure 4-4. Optional Polarity Switch

⚠ CAUTION

ARCING can damage switch.

- Do not change position of any Amperage control or switch while welding or under load.

Arcing inside switch can damage contacts, causing switch to fail.

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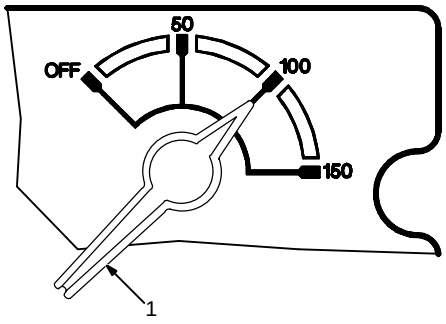
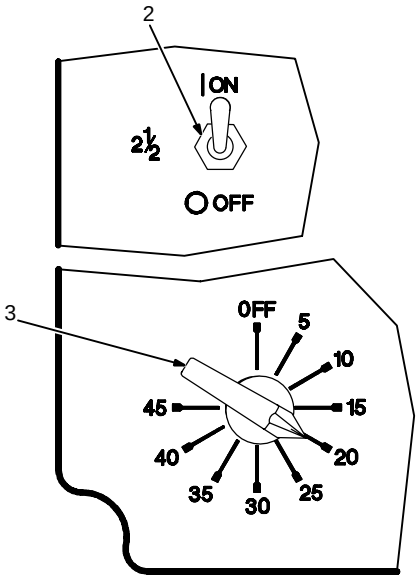




In Example:
Total Amperage Output = 122.5 A
(100 A + 20 A + 2.5 A)

1 Coarse Amperage Control

Use control to select coarse weld amperage output.

To set amperage using only the Fine Amperage control, place Coarse Amperage control in Off position.

2 2-1/2 Ampere Switch (Optional)

Use switch to add 2-1/2 amperes to weld output.

To add 2-1/2 amperes to weld output, place switch in On position.

3 Fine Amperage Control

Use control to add amperage, in 5 ampere steps, to weld output.

Figure 4-5. Amperage Controls

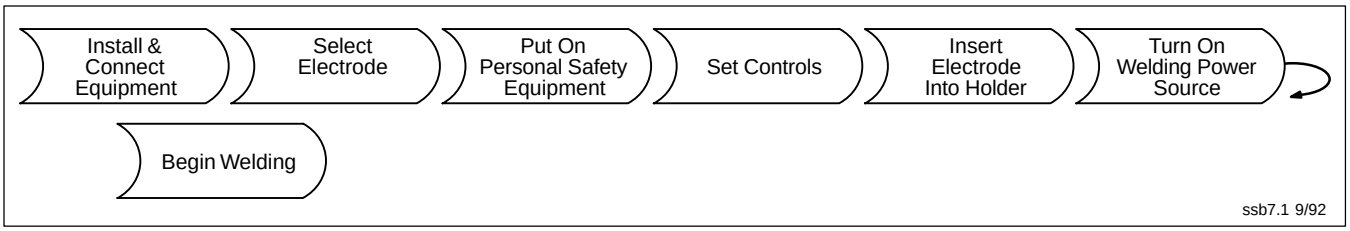


Figure 4-6. Sequence Of Shielded Metal Arc Welding (SMAW)

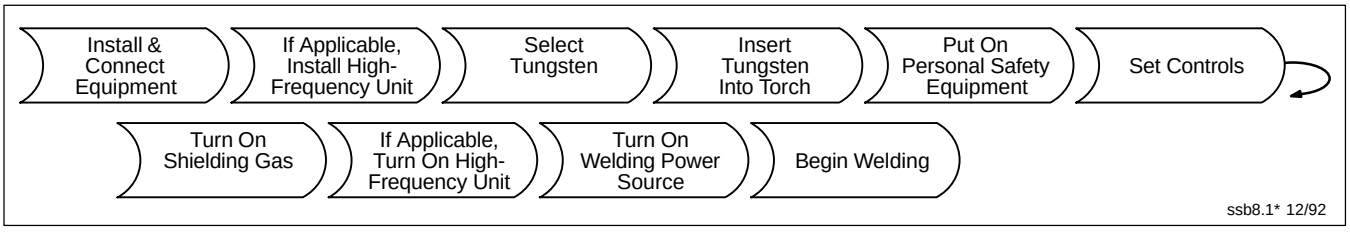


Figure 4-7. Sequence Of Gas Tungsten Arc Welding (GTAW)

SECTION 5 – MAINTENANCE & TROUBLESHOOTING

⚠ WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

- Allow cooling period before maintaining or servicing.

Maintenance to be performed only by qualified persons.

swarn8.1* 2/93

5-1. Routine Maintenance

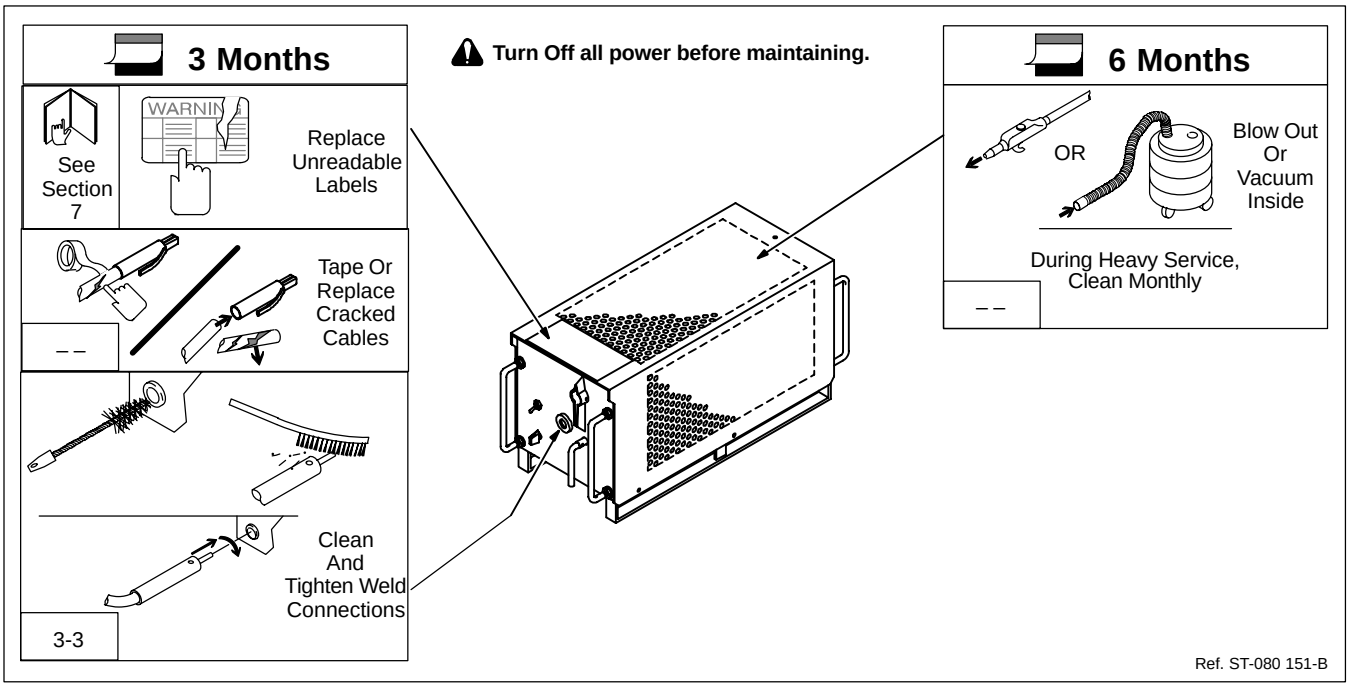
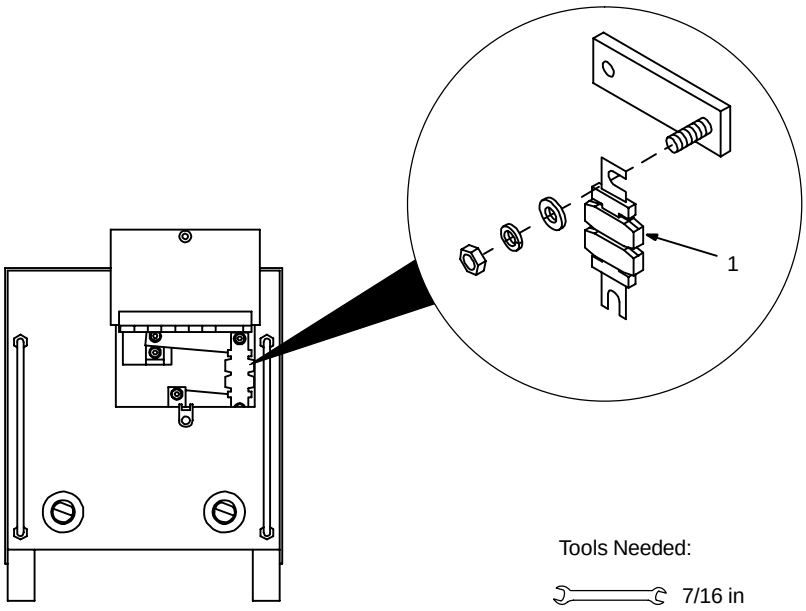


Figure 5-1. Maintenance Schedule

5-2. Overload Protection

WARNING

READ SAFETY BLOCKS at start of Section 5 before proceeding.



Fuse link F1 protects the grid from overload damage. If weld output stops, check fuse link as follows:

Turn Off welding power source and disconnect input power.

1 Fuse Link F1 (See Parts List For Rating)

Check and replace fuse link, if necessary.

Close rear access door.

Tools Needed:

7/16 in

Ref. ST-080 152-C

Figure 5-2. Fuse Link Location

5-3. Troubleshooting

WARNING

ELECTRIC SHOCK can kill.

- Do not touch live electrical parts.
- Turn Off welding power source, and disconnect input power before inspecting, maintaining, or servicing.

HOT PARTS can cause severe burns.

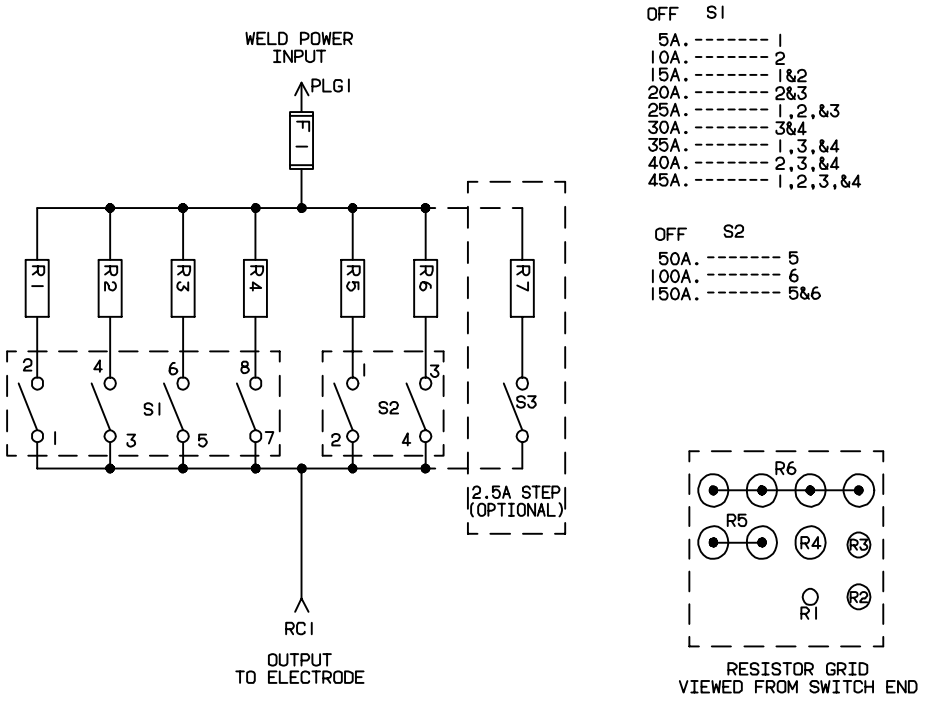
- Allow cooling period before servicing.

Troubleshooting to be performed only by qualified persons.

swarn9.1 2/93

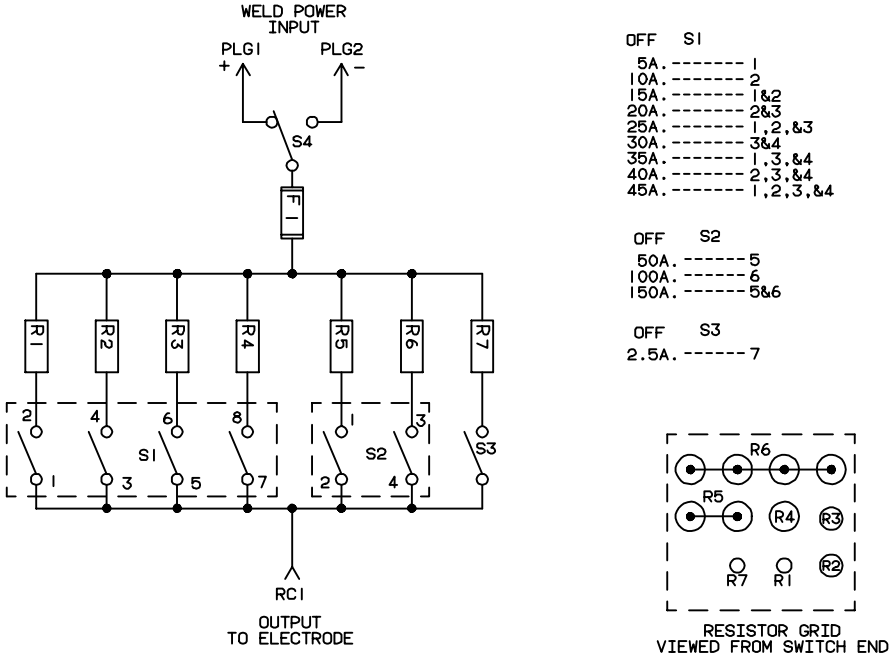
Table 5-1. Welding Trouble

Trouble	Remedy	Section
No weld output.	Check and replace open fuse link, if necessary.	5-2
	Check electrical input and output connections.	3-3
Erratic or improper weld output.	Select correct size weld cables according to Table 3-1.	– –
	Clean and tighten weld cable connections.	3-3



SA-162 468

Figure 6-1. Circuit Diagram For Models Without Polarity Switch



SA-047 615-C

Figure 6-2. Circuit Diagram For Models With Polarity Switch

NOTES

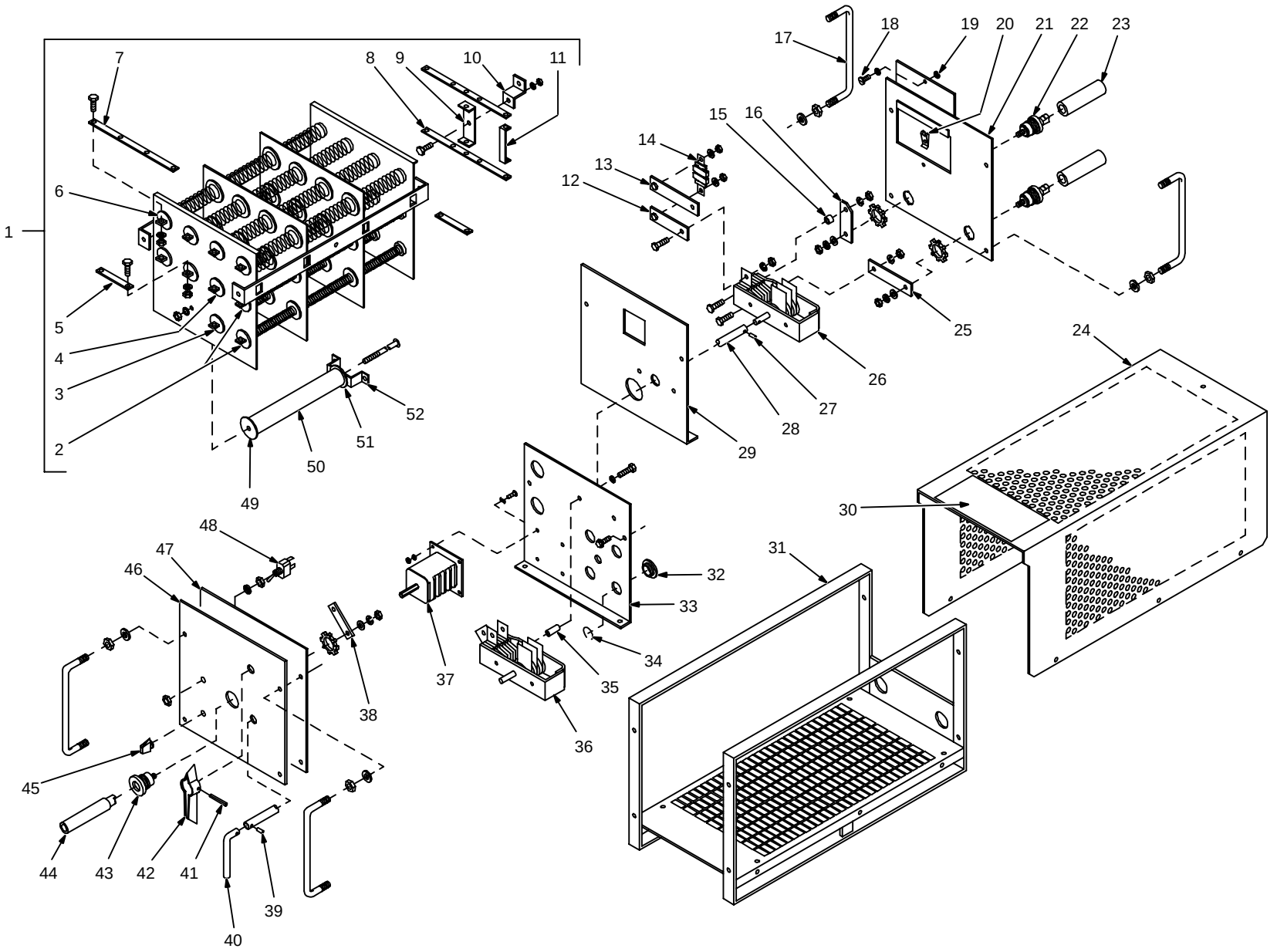


Figure 7-1. Complete Assembly (MOG-200PRC Model Illustrated)

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model MOG-200C	Quantity Model MOG-200PRC
			Figure 7-1. Complete Assembly		
1		059 834	RESISTOR ASSEMBLY, current (consisting of)	1	
1		084 869	RESISTOR ASSEMBLY, current (consisting of)		1
2	R2,3	059 798	RESISTOR, 10A	2	2
3	R1	059 797	RESISTOR, 5A	1	1
4	R4	059 799	RESISTOR, 20A	1	1
5		059 765	BUS BAR, connecting resistors	2	2
6	R5,6	059 800	RESISTOR, 25A	6	6
7		059 766	BUS BAR, connecting resistors front	1	1
8		059 767	BUS BAR, connecting resistors rear	2	2
9		059 769	BUS BAR, connecting resistors rear	1	
9		084 863	BUS BAR, jumping resistors		1
10		059 771	BUS BAR, interconnecting	1	
10		168 419	BUS BAR, mtg fuse		1
		059 726	INSULATOR, end	20	20
		059 728	INSULATOR, support 1.125 bore	14	14
		059 727	INSULATOR, support .625 bore	6	6
		010 199	TUBING, stl .257 ID x .048 wall x 1.000	1	1
11		059 768	BUS BAR, connecting resistors	1	1
12		059 796	BUS BAR, input	1	
12		091 662	BUS BAR, connecting		1
13		091 660	BUS BAR, connecting		1
14	F1	*027 267	FUSE, link 300A 250V	1	1
15		059 805	TUBING, cop .540 OD x .123 wall x .312	1	2
16		110 671	BUS BAR, input positive		1
17		059 764	HANDLE, carrying	4	4
18		010 853	FASTENER, scr sltd hd No. 2	1	1
19		010 855	RETAINER, screw No. 2	1	1
20		010 854	NUT, speed No. 2 clip on	1	1
21		059 780	PANEL, rear	1	
21		110 705	PANEL, rear		1
22	PLG1	056 271	RECEPTACLE, twlk uninsul male (CAM-LOC type)	1	
22	PLG1,2	056 271	RECEPTACLE, twlk uninsul male (CAM-LOC type)		2
		010 907	NUT, locking 1.000	1	2
23		039 633	CONNECTOR, twlk insul fem (CAM-LOC type)	1	2
24		+059 801	WRAPPER	1	1
25		110 670	BUS BAR, input negative		1
26	S4	049 594	SWITCH, polarity		1
27		010 651	PIN, spring CS .156 x 1.00		1
28		071 034	EXTENSION, handle		1
29		059 774	BAFFLE, rear	1	1
30		134 327	LABEL, warning general precautionary	1	1
31		088 968	FRAME, base/rail	1	
31		110 685	FRAME, base/rail		1
32		059 727	INSULATOR, support .625 bore	4	4
33		059 775	BAFFLE, front	1	1
34		059 724	RING, retaining ext .886 dia x .021thk	4	4
35		010 199	TUBING, stl .275 ID x .048 wall x 1	1	1
36	S2	059 763	SWITCH, current high	1	1
37	S1	059 807	SWITCH, current low	1	1
38		059 795	BUS BAR, output	1	1
39		078 671	PIN, spring CS .093 x .500		1
40		071 033	HANDLE, switch		1
41		010 647	PIN, spring CS .156 x 1.250	1	1
42		059 773	HANDLE, switch	1	1
43	RC1	039 628	RECEPTACLE, twlk insul fem (CAM-LOC type)	1	1
44		039 630	CONNECTOR, twlk insul male (CAM-LOC type)	1	1
45		006 790	KNOB, switch fine	1	1

Item No.	Dia. Mkgs.	Part No.	Description	Quantity Model MOG-200C	Quantity Model MOG-200PRC
Figure 7-1. Complete Assembly (Continued)					
. . . 46			NAMEPLATE, (order by model and serial number)	1	1
. . . 47		059 776	PANEL, front	1	
. . . 47		110 731	PANEL, front		1
. . . 48	S3	♦011 609	SWITCH, tgl SPDT 15A 125VAC	1	1
. . . 49		♦059 933	WASHER, flat mica .750 ID x 1.500 OD x .030thk	2	2
. . . 50	R7	♦059 932	RESISTOR, WW fxd 175W 20 ohm	1	1
. . . 51		♦057 430	WASHER, ctrg spcl No. 18	1	1
. . . 52		♦081 016	BRACKET, mtg resistor	1	1

*Recommended Spare Parts.
+When ordering a component originally displaying a precautionary label, the label should also be ordered.
♦Optional equipment for MOG-200C
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

Notes

Notes

Warranty Questions?

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(Equipment with a serial number preface of "LA" or newer)

This limited warranty supersedes all previous Miller warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY – Subject to the terms and conditions below, Miller Electric Mfg. Co., Appleton, Wisconsin, warrants to its original retail purchaser that new Miller equipment sold after the effective date of this limited warranty is free of defects in material and workmanship at the time it is shipped by Miller. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

Within the warranty periods listed below, Miller will repair or replace any warranted parts or components that fail due to such defects in material or workmanship. Miller must be notified in writing within thirty (30) days of such defect or failure, at which time Miller will provide instructions on the warranty claim procedures to be followed.

Miller shall honor warranty claims on warranted equipment listed below in the event of such a failure within the warranty time periods. All warranty time periods start on the date that the equipment was delivered to the original retail purchaser, or one year after the equipment is sent to a North American distributor or eighteen months after the equipment is sent to an International distributor.

1. 5 Years Parts – 3 Years Labor
   * Original main power rectifiers
   * Inverters (input and output rectifiers only)
2. 3 Years — Parts and Labor
   * Transformer/Rectifier Power Sources
   * Plasma Arc Cutting Power Sources
   * Semi-Automatic and Automatic Wire Feeders
   * Inverter Power Supplies
   * Intellitig
   * Engine Driven Welding Generators **(NOTE: Engines are warranted separately by the engine manufacturer.)**
3. 1 Year — Parts and Labor
   * DS-2 Wire Feeder
   * Motor Driven Guns (w/exception of Spoolmate 185 & Spoolmate 250)
   * Process Controllers
   * Positioners and Controllers
   * Automatic Motion Devices
   * RFCS Foot Controls
   * Induction Heating Power Sources
   * Water Coolant Systems
   * HF Units
   * Grids
   * Maxstar 140
   * Spot Welders
   * Load Banks
   * Miller Cyclomatic Equipment
   * Running Gear/Trailers
   * Plasma Cutting Torches (except APT & SAF Models)
   * Field Options
     (NOTE: Field options are covered under True Blue® for the remaining warranty period of the product they are installed in, or for a minimum of one year — whichever is greater.)
4. 6 Months — Batteries
5. 90 Days — Parts
   * MIG Guns/TIG Torches
   * Induction Heating Coils and Blankets
   * APT, ZIPCUT & PLAZCUT Model Plasma Cutting Torches
   * Remote Controls
   * Accessory Kits
   * Replacement Parts (No labor)
   * Spoolmate 185 & Spoolmate 250
   * Canvas Covers

Miller's True Blue® Limited Warranty shall not apply to:

1. **Consumable components; such as contact tips, cutting nozzles, contactors, brushes, slip rings, relays or parts that fail due to normal wear.**
2. Items furnished by Miller, but manufactured by others, such as engines or trade accessories. These items are covered by the manufacturer's warranty, if any.
3. Equipment that has been modified by any party other than Miller, or equipment that has been improperly installed, improperly operated or misused based upon industry standards, or equipment which has not had reasonable and necessary maintenance, or equipment which has been used for operation outside of the specifications for the equipment.

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Please complete and retain with your personal records.

Model Name Serial/Style Number

Purchase Date (Date which equipment was delivered to original customer.)

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For Service

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Always provide Model Name and Serial/Style Number.

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	Circuit Diagrams
	Welding Process Handbooks
Contact the Delivering Carrier for:	File a claim for loss or damage during shipment.
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